

Description of a new species of the genus *Apistogramma* (Teleostei, Perciformes, Cichlidae) from Peru

by

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With 5 figures

ABSTRACT

Description of a new species of the genus *Apistogramma* (Teleostei, Perciformes, Cichlidae) from Peru. — The new species *Apistogramma nijsseni* is described on basis of 8 females, 20.5-30.7 mm in standard length, collected near Jenaro Herrera, lower R. Ucayali, Peru. It differs from other species in the genus above all by its distinctive colour pattern, including, in adults, a very broad black third flank bar and black cheek.

INTRODUCTION

The cichlid genus *Apistogramma* Regan, 1913, comprises more than 40 small species, many still undescribed, in tropical freshwaters of South America east of the Andes. The new species described in this paper was collected by Mr Patrick de Rham near Jenaro Herrera on the lower R. Ucayali in Peru. It was brought to my attention by Dr Han Nijssen (Zoölogisch Museum Amsterdam), who identified a part of the collection, and Dr Volker Mahnert (Muséum d'Histoire naturelle de Genève), who also lent the material for study.

Interest attaches to the new species as the cichlid fauna of the Peruvian Amazonas basin is poorly known and as the adults present a colour pattern very different from those hitherto described in the genus.

I take pleasure in expressing my gratitude to Drs Nijssen and Mahnert for directing the material into my hands, to Ms Lis Kløve-Björklund (Zoological Institution, University of Stockholm) for executing the photograph (Fig. 1), and to the collector, Mr de Rham, for habitat information. I am indebted also to Mr Sten Österlöf (Swedish Museum of

Natural History), who translated the German Zusammenfassung, and to Mr Tjelvar Odsjö, of the same institution, who offered valuable criticism of the first draft of the manuscript.

METHODS

Except for the following, the methods used are explained in KULLANDER (in press *a*, with additions in in press *b*). The LP rakers count is that of the rakers along the edge of the lower pharyngeal bone on one side. Jaw teeth are counted on one side of the jaw only. Abbreviations employed include: SL (standard length), TL (total length), CP (caudal peduncle) and MHNG (Muséum d'Histoire naturelle de Genève catalogue number).

Apistogramma nijsseni n. sp. (Fig. 1)

Holotype: MHNG 1595.82, ♀, 30.7 mm SL, 39.9 mm TL. Perú (Loreto), R. Ucayali system, Jenaro Herrera, R. Copal, "marigots des Tupacs". 18 October 1977. Leg. P. de Rham.



FIG. 1.

Apistogramma nijsseni n. sp. Holotype, ♀, 30.7 mm SL (MHNG 1595.82).

Paratypes: MHNG 1595.83-85, 3 ♀♀, 24.2, 25.4, 27.0 mm SL. Collected together with the holotype.—MHNG 1595.86-89, 4 ♀♀, 20.5, 24.2, 26.6, 29.2 mm SL. Perú (Loreto), R. Ucayali system, Jenaro Herrera, R. Copal, "marigots des Tupacs". 6 June 1977. Leg. P. de Rham.

The material, preserved in alcohol, is in fine condition, except that the MHNG 1595.86-89 series is less well preserved, two specimens particularly discoloured. One paratype is deposited in the Zoölogisch Museum Amsterdam (from MHNG 1595.83; now ZMA 116.054), another in the Swedish Museum of Natural History, Stockholm (MHNG 1595.89, 29.2 mm SL; now NRM 11298).

Type-locality: Mr de Rham (*in litt* to V. Mahnert) gives the following information about Jenaro Herrera, situated on the right bank of the lower R. Ucayali, and the nearby type-locality: "Coord. approx. 4° 50' lat sud 73° 40' long ouest. C'est la vraie selva baja encore que de bien modestes collines arrivent au fleuve à cet endroit. Alt. env. 140 m. ... La rivière Copal se trouve à 15 km de Jenaro Herrera à l'est et coule dans la direction sud-nord pour aller rejoindre un autre cours d'eau qui se jette dans l'Ucayali, bien en aval de Jenaro Herrera. Sur les bords du Copal, s'est installé un petit groupe de bûcherons, les pré-coopérative Tupac Amaru, d'où mon appellation: marigots des Tupacs pour les petits ruisseaux des alentours. Les eaux sont de type noir plus ou moins foncées sans pourtant atteindre en général le noir rouge qui j'ai vu en Guyana. Topographie des collines basses."

Etymology: Named for Dr Han Nijssen, Curator of fishes, Zoölogisch Museum Amsterdam, and author of many papers on South American fishes.

Diagnosis: Length of head 32.7-34.8%, body depth 34.6-38.1% of SL. CP length 66.7-85.0% of CP depth. D. XV.8, XVI.7. A. III.7. Squ.long. 22. Rakers 1-2. Preoperculum entire. Dorsal and caudal fin shapes of adult males unknown, in females the former without produced lappets, the latter rounded. Lateral spot, caudal spot and, usually, midventral stripe present. No pectoral spot, chest blotch or abdominal stripes. Bars faint. Lateral band indicated in young, absent in adults. Adult females with strongly pigmented and extended Bar 3 and black cheek, also the distal part of the caudal peduncle may be black. Dorsal fin dark anteriorly. Caudal fin immaculate, with colourless infra-marginal and dark marginal band along distal edge (adults) or with few light stripes across middle rays (young). Differentiated from the other Peruvian species of *Apistogramma* by colour pattern, head and body shape, and squ.long count. Easily distinguished from all members of the genus by its distinctive colour pattern.

Description: Qualitative data from holotype unless otherwise stated. Quantitative data from all specimens; see also Table I.

Body moderately elongate, broadest and deepest just behind gill-cover. Dorsal contour nearly straight, sloping from just behind dorsal fin origin, continuous with predorsal contour, discontinuous with caudal peduncle dorsal contour which about horizontal, straight. Chest contour slightly sloping; belly contour about straight; anal base contour straight, sloping at an angle similar to that of ventral margin of caudal peduncle. Head moderately elongate, longer than deep, slightly shorter than body depth. Predorsal contour straight ascending to above orbit, posteriorly slightly curved, angle of slope about 43°; preventral contour almost straight, slightly convex, angle of slope about 33°, continuous with chest contour. Snout pointed, contours equal, straight. Ascending processes of premaxilla reaching vertical from anterior edge of orbit. Angle of maxilla 51°; aboral tip exposed, reaching about vertical from anterior edge of orbit. Lower jaw distinctly longer than upper but equal anteriorly. Orbit diameter 36.8-43.3% ($\bar{x}$ = 39.8%)

TABLE I

Measurements (in mm) and counts of the type-series of *Apistogramma nijsseni*.
Range and mean for measurements are in per cent of SL. The 24.2 mm specimen first listed is from MHNG 1595.83-85.

	30.7	29.2	27.0	26.6	25.4	24.2	24.2	20.5	Range	$\bar{X}$
SL	30.7	29.2	27.0	26.6	25.4	24.2	24.2	20.5		
Tl	39.9	38.8	36.8	35.4	32.9	32.3	32.8	27.0	32.7-34.8	34.0
Head length	10.6	9.9	9.4	9.1	8.7	8.3	8.1	6.7	27.3-29.5	28.4
Head depth	8.8	8.6	7.9	7.5	7.2	6.8	6.7	5.6	34.6-38.1	36.0
Body depth	10.7	10.7	10.3	10.0	8.8	8.5	8.6	7.3	35.0-38.9	36.6
Predorsal length	11.5	10.8	10.5	10.0	8.9	8.7	8.5	7.3	38.4-41.0	39.9
Preventral length	12.1	11.2	11.0	10.9	10.1	9.6	9.6	8.3	12.7-14.1	13.5
Orbit diameter	3.9	3.7	3.8	3.7	3.4	3.4	3.2	2.9	5.4- 7.5	6.9
Snout length	2.3	2.0	2.0	1.9	1.8	1.7	1.6	1.1	6.7- 8.3	7.5
Cheek depth	2.3	2.4	2.1	2.2	1.7	1.8	1.7	1.4	16.1-17.7	16.9
Head width	5.1	5.0	4.6	4.7	4.1	4.1	4.0	3.5	7.4- 8.6	7.8
Interorbital width	2.4	2.4	2.1	2.3	1.9	1.8	1.8	1.6	2.4- 3.4	3.0
Preorbital depth	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.5	10.3-12.0	11.1
Upper jaw length	3.6	3.5	3.2	3.0	2.7	2.5	2.5	2.2	13.0-15.8	14.1
Lower jaw length	4.4	4.2	4.1	4.2	3.3	3.4	3.2	2.7	14.5-15.6	14.9
Postorbital head length	4.6	4.4	4.2	3.9	3.7	3.5	3.6	3.0	15.6-17.4	16.5
CP depth	4.8	4.8	4.5	4.5	4.0	4.0	4.2	3.4	11.2-13.4	12.0
CP length	3.6	3.5	3.1	3.0	3.4	2.7	2.8	2.7	56.6-61.6	59.2
Dorsal base length	17.8	17.6	16.3	16.1	14.7	14.0	14.9	11.6	18.0-21.1	19.2
Anal base length	6.0	5.7	5.7	5.1	4.8	4.5	4.6	3.7	26.3-30.6	29.0
Pectoral fin length	8.4	8.3	8.1	7.0	7.3	7.4	7.3	6.2	13.4-16.1	14.7
Ventral spine length	4.3	4.2	4.0	3.9	3.4	3.6	3.7	3.3	27.8-31.8	29.6
Ventral fin length	9.2	8.5	7.9	7.4	7.6	7.7	7.0	6.2	13.7-15.8	14.9
Last D spine length	4.2	4.2	4.2	4.2	3.6	3.8	3.8	3.1	14.7-17.1	16.1
Last A spine length	4.5	4.7	4.6	4.4	3.8	3.9	3.9	3.5	10-12	10.9
Li ₁ (c)	10	12	12	12	10	10	10	11	13-16	14.4
Li ₁ (cp)	14	14	15	15	14	13	14	16	2-5	3.1
Li ₂ (c)	3	5	4	3	2	3	3	2	2-4	2.8
Li ₂ (cp)	7	7	7	8	9	7	7	6	3-5	4.3
Cheek scale series	4	2	3	3	2	4	2	2	2-3	2.4
Squ.op.	10	11	13	9	13	11	9	—	9-11	10.1
Squ.sop.	3	4	5	4	5	5	4	—	15-16	15.9
Squ.iop.	3	2	2	2	3	3	2	2	13-15	13.8
Squ. caud.	7	6	6	8	6	4	6	3		
Squ.prd.	10	10	11	9	10	11	10	10		
D spines	16	16	16	16	15	16	16	16		
Rakers	1	1	1	1	2	1	1	2		
LP rakers	15	14	13	13	13	15	14	13		

of head length, situated in dorsal and rostral halves of head; tangential. Preoperculum entire in all specimens.

Length of exposed part of body scales nearly uniform; depth of anterior flank scales about twice depth of those along side margins, size decrease gradual. Predorsal scales cycloid ventrally to anteriorwards curved line between dorsal tip of preoperculum and dorsal fin origin. Chest not naked anteriorly; squ. prv. 10 in all specimens. Cheek scales small, cycloid, behind orbit larger and ctenoid; missing anteroventrally; in smaller specimens only posterior part scaled (Fig. 2), degree of scaling positively correlated with SL. Gill-cover scales cycloid except dorsal opercular scales. Squ. long. 22, squ. tr. $7+1+1$, squ. ped. 16 in all specimens. Lateral lines with $9+0+p+1+3p/4p+3$ (right side) and $11+4p+pb/4p+3$ (left side) scales, not continued on caudal fin (p = pore,



FIG. 2-3.

2: Incomplete cheek scaling in a paratype of *Apistogramma nijsseni*, 24.2 mm SL (MHNG 1595.86-89). Scale 1 mm. 3: Lower pharyngeal tooth-plate in a paratype of *Apistogramma nijsseni*, 29.2 mm SL (MHNG 1595.86-89). Occlusal view; scale 1 mm.

0 = unmodified scale, pb = subserial pore). Upper line to below last dorsal spine; lower to about 5th anal ray. In the entire material 1-2 subserial pores in the upper lateral line in 12 of 16 lines; a caudal canal in one specimen, a caudal pore in 4 specimens. Dorsal and anal fins naked. Proximal third of caudal fin covered by ctenoid scales.

Dorsal spines increasing in length to 5th from which subequal, the last longest. Lappets pointed, reaching slightly beyond spine tips. Soft part rounded; rays rapidly increasing in length to 3rd, rapidly decreasing from 4th to last; tip reaching little beyond caudal fin base. Soft anal fin similar, slightly shorter. D. XV.8 (1), XVI.7 (7, including holotype). A. III.7 (8). Pectoral fin rounded; 5th ray longest; dorsalmost and two ventral-most simple, remainder with two branches; reaching to vertical from vent; P. 12 (8). Ventral fin acuminate; outermost ray slightly produced, reaching anal fin origin, inner rays gradually shorter. Caudal fin rounded; marginal rays simple, inner with two branches; 16 principal rays in all specimens.

Teeth of lower jaw in about 3 series anteriorly, near symphysis very irregularly arranged inner teeth, the outer series continued laterally; rather long, slender, moderately recurved; in outer series slowly increasing in size towards symphysis; inner smaller than outer. Teeth of upper jaw similar in shape and arrangement but first inner series slightly

extended laterally. Arranged in series from smallest to largest specimen, their teeth numbers are: 24/24, 26/24, 24/25, 24/26, 23/28, 28/29, 24/26, 28/30 in outer series on one side of upper jaw/lower jaw ($\bar{x}$ = 25.1/26.5).

Vertebrae 12+12, supraneural 1 in all specimens. Lower pharyngeal bone examined in one specimen only; shape and dentition shown in Figure 3.

Preserved coloration: Holotype: Ground colour yellowish white; counter-shaded: back pale grey-brown, lighter ventrally. Only the throat and the area behind the gill-cover and before the pectoral fin of pure ground colour. Markings deep black except for the pale indistinct vertical bars.

The genus-characteristic 7 flank bars can be distinguished but are very indistinct. They extend from the dorsal fin base to almost the belly edge insofar as they can be traced

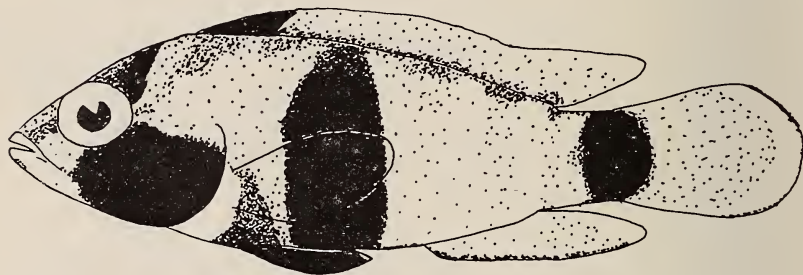


FIG. 4.

Colour pattern of the holotype of *Apistogramma nijsseni*.

in the countershading, the first bar runs obliquely forwards to the gill-cover. Above the upper lateral line strongly pigmented, like dark not well defined spots extending onto basal parts of dorsal fin membranes. Bar 3 very broad and intensely pigmented, above all below the upper lateral line, and continued across the belly to the other side of the body, about 5 scales broad.

The end part of the caudal peduncle, including Bar 7, and the base of the caudal fin covered by a large black spot. No trace of a lateral band. No lateral spot discernible in Bar 3 because of the intense pigmentation of the bar. A midventral stripe extends from around vent to Bar 3. Black around ventral fin bases, dorsally to behind the pectoral fin base. No abdominal stripes or pectoral spot. Gill-cover and greater part of cheek covered by a black spot, extended ventrally on the branchiostegal membrane. Lower jaw, lips and snout neutral grey; a dark spot on chin below lower lip. Preorbital stripe only slightly darker than the rest of the snout. Superorbital stripe broad, intensely pigmented, to the nape.

Dorsal fin brownish, base black, soft portions outwards gradually becoming colourless; anterior 3 spines and membranes black. Caudal fin behind the base spot grey, distally a broad colourless inframarginal band, distal edge narrowly dark. Anal fin greyish, lower edge dark-seamed; first spine and membrane black. Ventral fin black, outer part of first ray white.

Paratypes, MHNG 1595.83-85: Similar in basic coloration to holotype. The vertical bars become more distinct with decreasing size. Only in the holotype does Bar 3 reach

to the belly edge. Caudal base spot round/ovate, restricted to the caudal fin. About 3 terminal spot stripes in the dorsal and anal fins may be traced. Figure 5 shows the colour pattern of the smallest specimen (24.2 mm) for comparison with that of the holotype (Fig. 4). The others and the MHNG 1595.86-89 specimens are intermediate in the development of the colour pattern between that specimen and the holotype. Notably, the 24.2 mm specimen lacks midventral stripe and ventral base spot and is the only specimen with striped caudal fin. It may be described as follows:

Ground colour yellowish whiteish. Bars relatively distinct but faint, brown, gradually darker dorsally, faintly extended onto dorsal fin base. Lateral band indicated. Lateral spot in Bar 3 deep, ovate. Postorbital stripe indicated, superorbital and suborbital



FIG. 5.

Colour pattern of a paratype of *Apistogramma nijsseni*,
24.2 mm SL (MHNG 1595.83-85).

stripes moderately wide, distinct. No pectoral spot, abdominal stripes or midventral stripe. Lips and ventral part of head pale. Dorsal fin dark on anterior membranes and spines, otherwise dusky. Caudal fin dusky, base spot irregular, ovate; about 4 light vertical stripes across middle rays. Anal fin dusky with narrow black margin. Ventral fin white.

Paratypes, MHNG 1595.86-89: Two specimens agree with the preceding in coloration. The 20.5 and 26.6 mm specimens are discoloured.

Distribution and Ecology. Known only from the type-locality, on the lower R. Uca-
yali in Peru. For habitat information see above ("Type-locality"). Associated species
include *Apistogramma agassizii* (Stendachner, 1875) (two specimens, 22.7 and 25.8 mm,
examined, ZMA 115.209).

DISCUSSION

The phyletic affinities of *A. nijsseni* are unclear. It differs from all other *Apisto-*
gramma species in the colour pattern of adult females. Further it is remarkable in having
only a very faint lateral band in juveniles, absent in adult females, whilst all other members
of the genus have a distinct lateral band or a series of spots in its place. Another advanced
feature may be the incompletely scaled cheek. Ancestral traits include the triserial jaw
dentition, the presence of bars, the absence of a chest blotch and the scaled throat region.

From another Peruvian *Apistogramma*, *A. nijsseni* is differentiated by, amongst other features, its deeper body, fewer squ. long. scales and coloration. *A. agassizii* (sympatric, R. Amazonas system in Peru and Brazil, R. Solimões system) is more elongate (depth 26.8-35.5% of SL, $\bar{x}$ = 30.9), has a narrower head (depth 22.8-28.8% of SL, $\bar{x}$ = 25.1) and more squ. long. scales (22-24, $\bar{x}$ = 23.3). It lacks a caudal spot but has a distinct lateral band. *A. bitaeniata* Pellegrin, 1936 (R. Amazonas, Peru, and R. Solimões systems) is also more elongate (depth 27.6-34.2% of SL, $\bar{x}$ = 30.5) and has a narrower head (depth 22.5-26.5% of SL, $\bar{x}$ = 24.4) and more squ. long. scales (23-24, $\bar{x}$ = 23.6). A notable characteristic of this species is the development of a broad band from the abdominal stripes. *A. cacatuoides* Hoedeman, 1951 (R. Ucayali, R. Amazonas, Peru, and R. Solimões systems) has slightly shorter and narrower head in females of 20.5-31.1 mm SL (length 30.9-32.8% of SL, $\bar{x}$ = 31.8, species range 30.9-36.5%; depth 26.0-27.9% of SL, $\bar{x}$ = 26.8, species range 24.6-31.3%), and they are also more elongate (body depth 34.1-36.1% of SL, $\bar{x}$ = 35.1, species range 33.1-39.4%); the squ. long. count range is 22-23 ($\bar{x}$ = 22.6), slightly more than in *A. nijsseni*. In the coloration *A. cacatuoides* is characterized by abdominal stripes, lateral band and well developed bars.

A. sweglesi Meinken, 1961, from "Letitia, Peru" (= evidently Leticia, Colombia) has a distinct lateral band continued on the proximal part of the caudal fin, and lacks a caudal spot. It appears to be a more elongate species (cf. MEINKEN 1961; the type-series is obviously lost). *A. amoena* (Cope, 1872) from the R. Ampí-yacú, is stated to have a lateral band, caudal spot and a spot at the tip of the caudal fin (cf. COPE 1872; the type-specimen is lost).

The *A. taeniatum* (non Günther) described by MEINKEN (1961) from "Letitia", evidently has a distinct lateral band and spotted caudal fin, and appears to differ significantly from *A. nijsseni* in body shape as well as in coloration. The *A. amoenum* (non Cope) reported by REGAN (1913) from the R. Ucayali are in poor shape, but have a much deeper head (31.3-31.9% of SL) and body (38.5-39.7% of SL), and when Regan examined them had a striped caudal fin.

Data on Peruvian species above are from material described in KULLANDER (in press a), comprising 226 specimens of *A. agassizii*, 22 specimens of *A. bitaeniata*, 23 specimens of *A. cacatuoides*, and the two R. Ucayali specimens described by REGAN (1913).

SUMMARY

Apistogramma nijsseni sp. n. is described on basis of 8 specimens from the lower R. Ucayali. The type-series comprises only females, 20.5-30.7 mm in standard length. The new species differs considerably from hitherto described members of the genus in the colour pattern of adult females, particularly in the broad, black third vertical bar and the black cheek and gill-cover. From other Peruvian *Apistogramma* species, it is further distinguished by slightly deeper body, shorter and deeper head, and fewer scales in a longitudinal series.

ZUSAMMENFASSUNG

Apistogramma nijsseni sp. n. wird von 8 Exemplaren aus dem unteren R. Ucayali beschrieben. Die Typen-Serie umfasst nur Weibchen, von 20,5-30,7 mm Standardlänge.

Die neue Art unterscheidet sich erheblich von bisher bekannten *Apistogramma*-Arten in der Farb-Zeichnung der adulten Weibchen, besonders markant an der breiten,

tiefschwarzen dritten senkrechten Seitenbinde, und der schwarzen kaudoventralen Kopfseite; weiter kann ein schwarzer Fleck am distalen Ende des Schwanzstieles vorkommen. Jungtiere haben eine nur schwach angedeutete horizontale Seitenbinde. Die nähere Verwandtschaft der *A. nijsseni* ist unklar. Von anderen peruanischen *Apistogramma*-Arten unterscheidet er sich u.a. durch verschiedene Färbungen, höheren Körper, kürzeren und höheren Kopf und auch weniger Schuppen in einer Längsreihe.

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